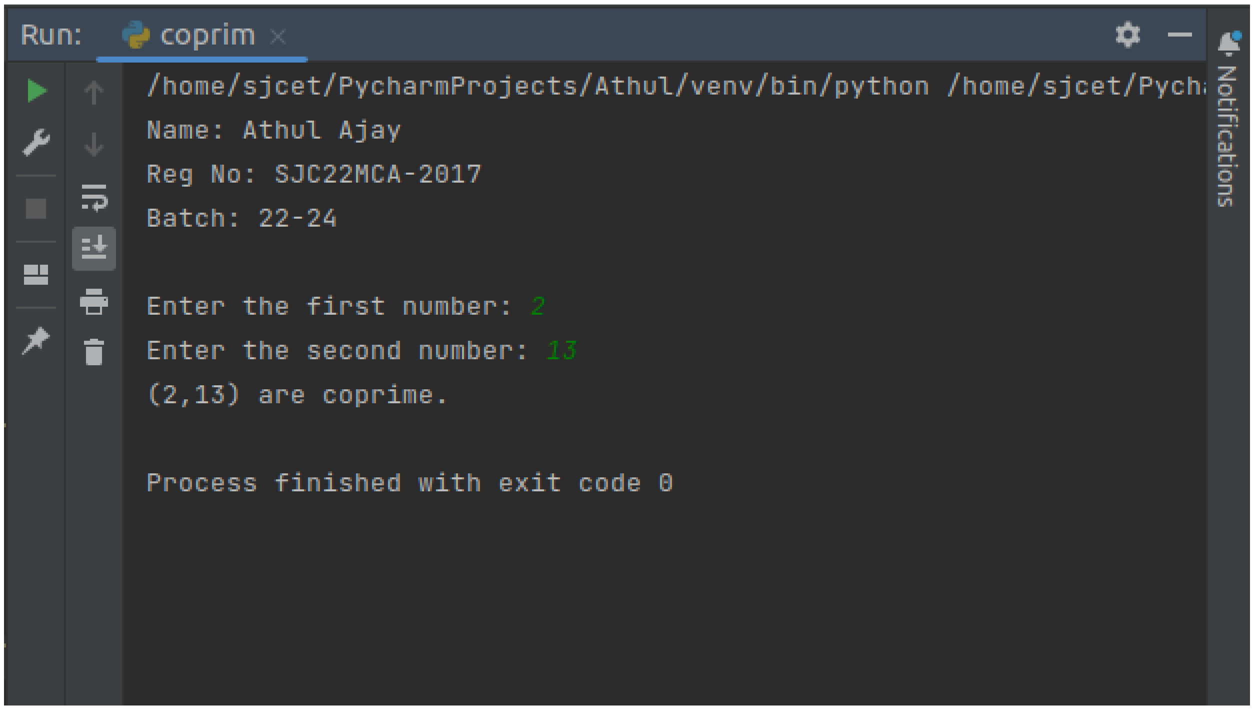
LAB CYCLE 1

1. Program to Print all non-Prime Numbers in an Interval

```
print("Name: Athul Ajay")
print("Reg No: SJC22MCA-017")
print("Batch: 22-24")
print()
lower = int(input("Enter the first number: "))
upper = int(input("Enter the second number: "))

print("Non Prime numbers between", lower, "and", upper, "are:")

for num in range(lower, upper + 1):

  if num > 1:
     for i in range(2, int(num ** 0.5)+1):
        if (num % i) == 0:
           break
     else:
        continue
  print(num)
```

OUTPUT:

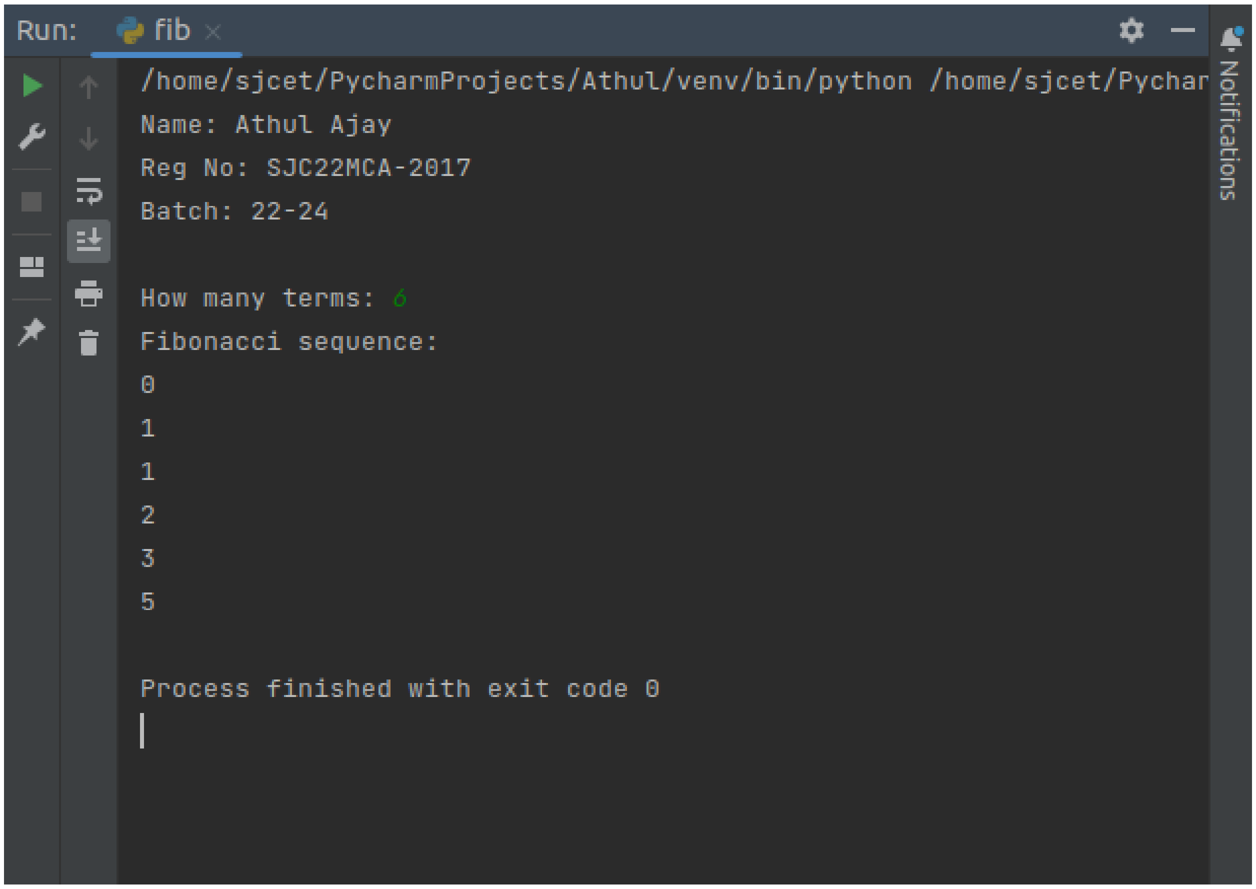


```
/home/sjcet/PycharmProjects/Athul/venv/bin/python /home/sjcet/Pych
Name: Athul Ajay
Reg No: SJC22MCA-2017
Batch: 22-24

Enter the first number: 2
Enter the second number: 13
(2,13) are coprime.

Process finished with exit code 0
```

2.Program to print the first N Fibonacci numbers.

```
print("Name: Athul Ajay")
print("Reg No: SJC22MCA-017")
print("Batch: 22-24")
print()
nterms = int(input("How many terms: "))
n1 = 0
n2 = 1
count = 0

if(nterms <= 0):
    print("Please enter a positive integer!")
elif(nterms == 1):
    print("Fibonacci sequence upto",nterms,":")
    print(n1)
else:
    print("Fibonacci sequence:")
    while count < nterms:
        print(n1)
        nth = n1 + n2
        n1 = n2
        n2 = nth
        count += 1
```

OUTPUT:

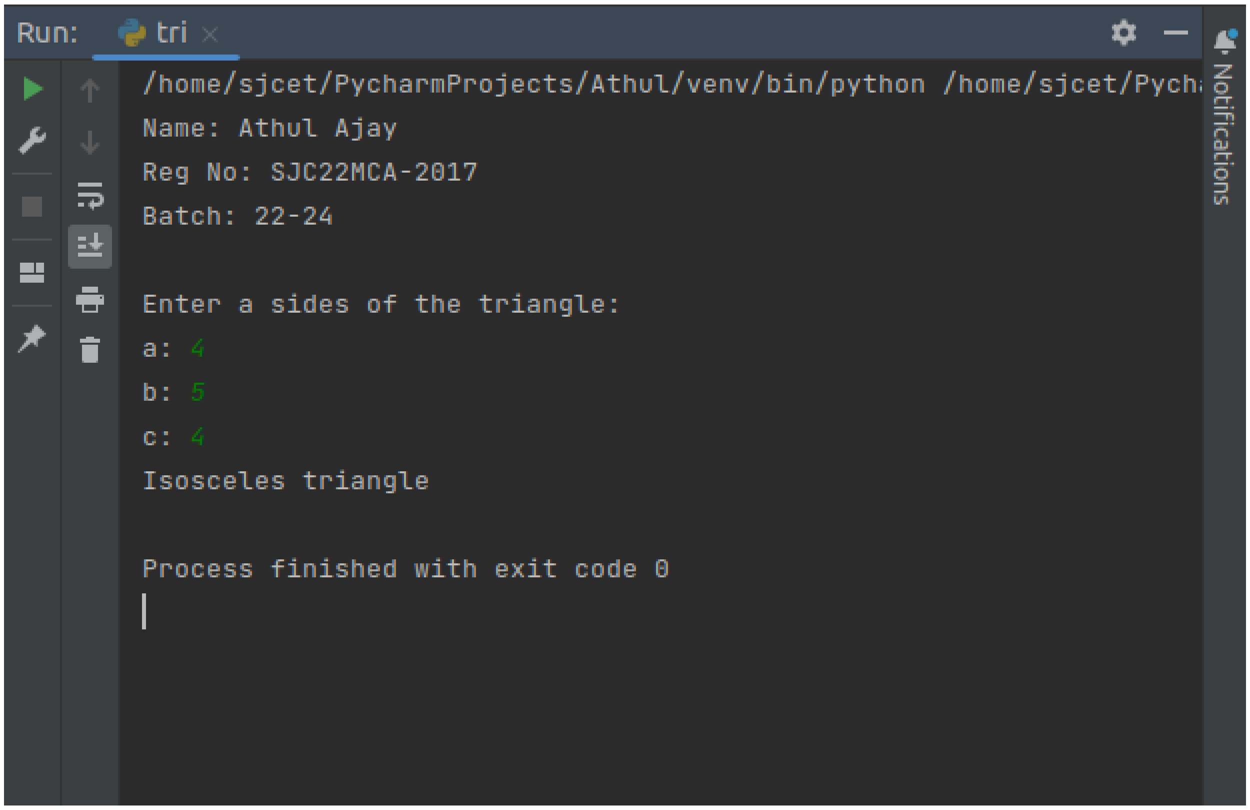


```
/home/sjcet/PycharmProjects/Athul/venv/bin/python /home/sjcet/Pychar
Name: Athul Ajay
Reg No: SJC22MCA-2017
Batch: 22-24

How many terms: 6
Fibonacci sequence:
0
1
1
2
3
5

Process finished with exit code 0
```

3. Given sides of a triangle, write a program to check whether a given triangle is an isosceles, equilateral or scalene.

```
print("Name: Athul Ajay")
print("Reg No: SJC22MCA-017")
print("Batch: 22-24")
print()
print("Enter a sides of the triangle: ")
a = int(input("a: "))
b = int(input("b: "))
c = int(input("c: "))

if a == b == c:
        print("Equilateral triangle")
elif a==b or b==c or a==c:
        print("Isosceles triangle")
else:
        print("Scalene triangle")
```

OUTPUT:

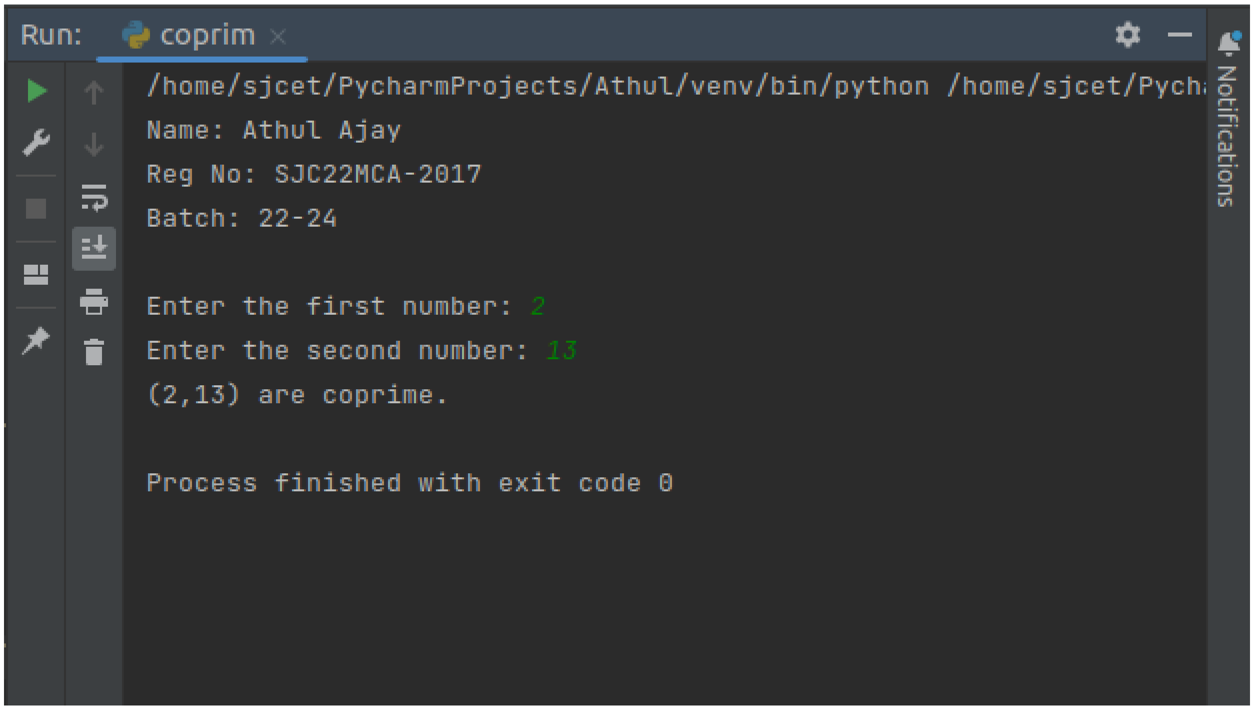


```
/home/sjcet/PycharmProjects/Athul/venv/bin/python /home/sjcet/Pycha
Name: Athul Ajay
Reg No: SJC22MCA-2017
Batch: 22-24

Enter a sides of the triangle:
a: 4
b: 5
c: 4
Isosceles triangle

Process finished with exit code 0
```

4. Program to check whether given pair of number is coprime

```
def calculate_gcd(a, b):
    while b:
        a, b = b, a % b
    return a

def are_coprime(a, b):
    gcd = calculate_gcd(a, b)
    return gcd == 1

# Input two numbers from the user
print("Name: Athul Ajay")
print("Reg No: SJC22MCA-017")
print("Batch: 22-24")
print()
num1 = int(input("Enter the first number: "))
num2 = int(input("Enter the second number: "))

if are_coprime(num1, num2):
    print(f"({num1},{num2}) are coprime.")
else:
    print(f"({num1},{num2}) are not coprime.")
```

OUTPUT:

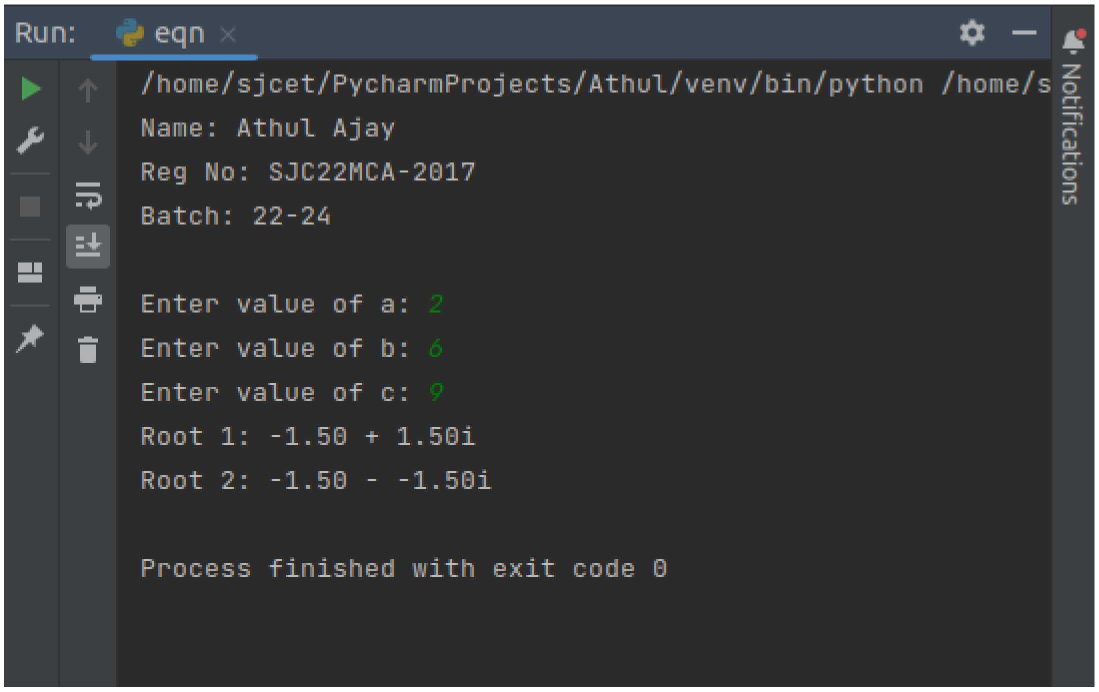


```
/home/sjcet/PycharmProjects/Athul/venv/bin/python /home/sjcet/Pycha
Name: Athul Ajay
Reg No: SJC22MCA-2017
Batch: 22-24

Enter the first number: 2
Enter the second number: 13
(2,13) are coprime.

Process finished with exit code 0
```

5.Program to find the roots of a quadratic equation (rounded to 2 decimal places)

```
import math
print("Name: Athul Ajay")
print("Reg No: SJC22MCA-2017")
print("Batch: 22-24")
print()
a = float(input("Enter value of a: "))
b = float(input("Enter value of b: "))
c = float(input("Enter value of c: "))
discri = b**2 - 4*a*c

if discri > 0:
    root1 = (-b + math.sqrt(discri)) / (2*a)
    root2 = (-b - math.sqrt(discri)) / (2*a)
    print(f"Root 1: {round(root1, 2)}")
    print(f"Root 2: {round(root2, 2)}")
elif discri == 0:
    root = -b / (2*a)
    print(f"Root: {round(root, 2)}")
else:
    real_part = -b / (2*a)
    img_part = math.sqrt(-discri) / (2*a)
    root1 = complex(real_part, img_part)
    root2 = complex(real_part, -img_part)
    print(f"Root 1: {root1.real:.2f} + {root1.imag:.2f}i")
    print(f"Root 2: {root2.real:.2f} - {root2.imag:.2f}i")
```

OUTPUT:

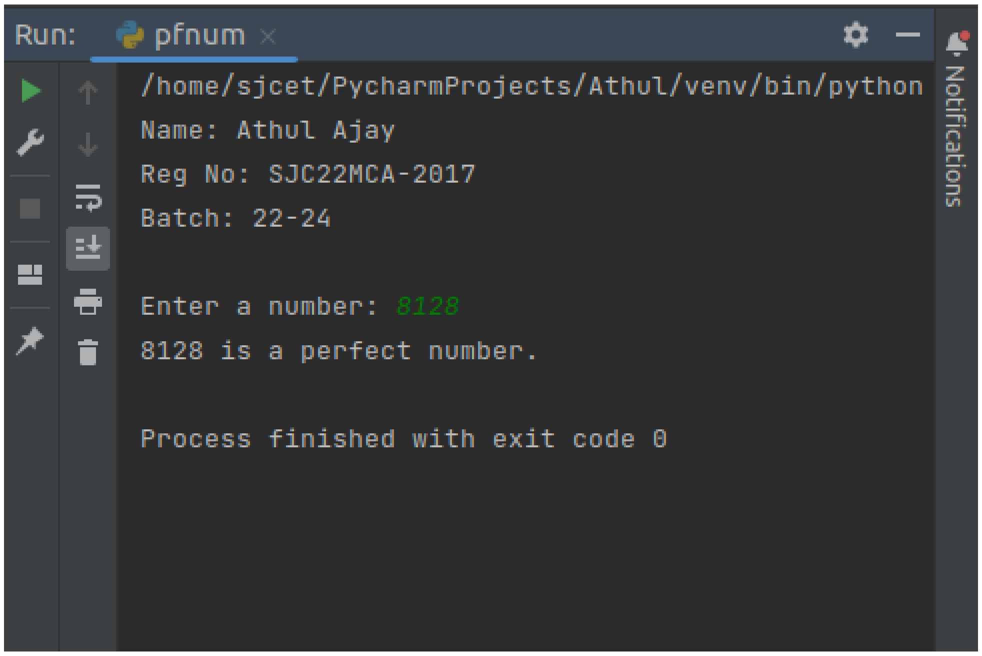


```
/home/sjcet/PycharmProjects/Athul/venv/bin/python /home/s
Name: Athul Ajay
Reg No: SJC22MCA-2017
Batch: 22-24

Enter value of a: 2
Enter value of b: 6
Enter value of c: 9
Root 1: -1.50 + 1.50i
Root 2: -1.50 - -1.50i

Process finished with exit code 0
```

6.Program to check whether a given number is perfect number or not (sum of factors =number)

```
print("Name: Athul Ajay")
print("Reg No: SJC22MCA-2017")
print("Batch: 22-24")
print()


def is_perfect_number(num):
    if num <= 0:
        return False

    factors_sum = 1

    for i in range(2, int(num ** 0.5) + 1):
        if num % i == 0:
            factors_sum += i
            if i != num // i:
                factors_sum += num // i

    return factors_sum == num


num = int(input("Enter a number: "))

if is_perfect_number(num):
    print(num, "is a perfect number.")
else:
    print(num, "is not a perfect number.")
```

OUTPUT:

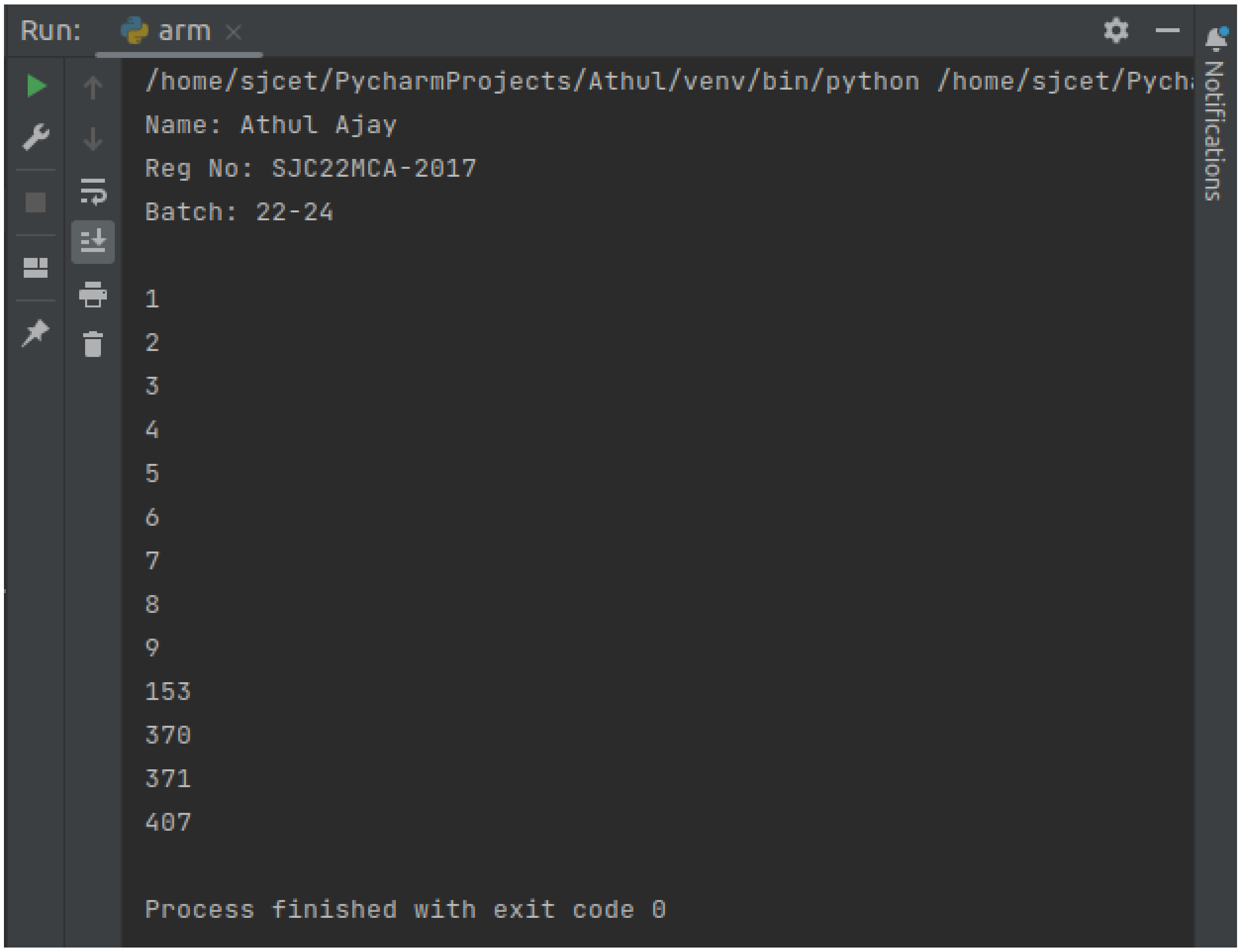


```
/home/sjcet/PycharmProjects/Athul/venv/bin/python
Name: Athul Ajay
Reg No: SJC22MCA-2017
Batch: 22-24

Enter a number: 8128
8128 is a perfect number.

Process finished with exit code 0
```

7.Program to display amstrong numbers upto 1000

```
print("Name: Athul Ajay")
print("Reg No: SJC22MCA-2017")
print("Batch: 22-24")
print()
lower = 1
upper = 1000

for num in range(lower, upper + 1):

    order = len(str(num))

    sum = 0

    temp = num
    while temp > 0:
        digit = temp % 10
        sum += digit ** order
        temp //= 10

    if num == sum:

        print(num)
```

OUTPUT:

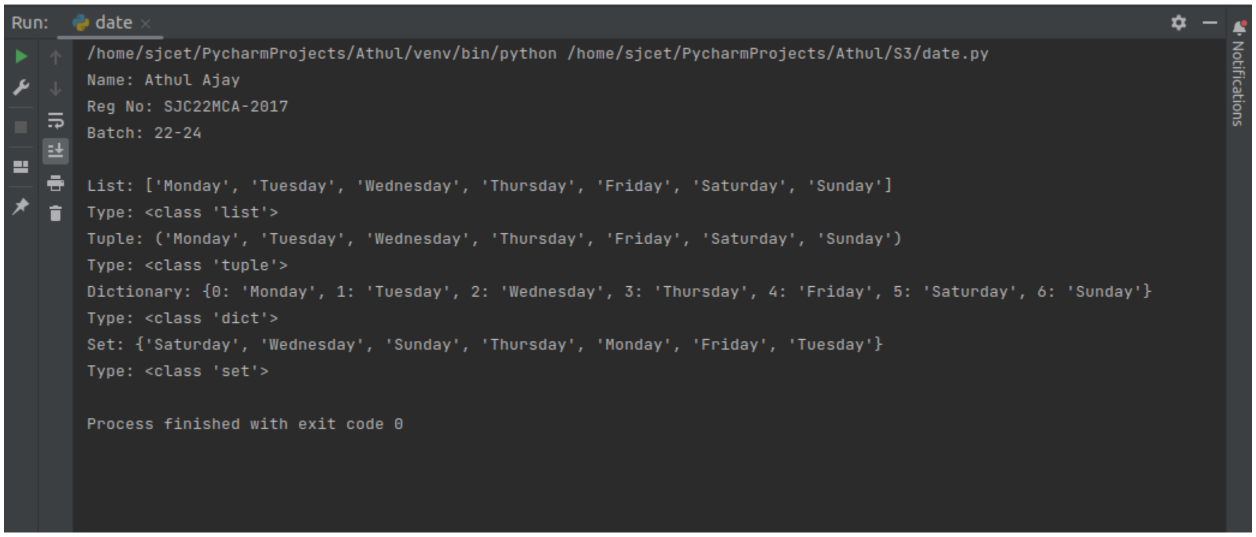


```
/home/sjcet/PycharmProjects/Athul/venv/bin/python /home/sjcet/Pych
Name: Athul Ajay
Reg No: SJC22MCA-2017
Batch: 22-24

1
2
3
4
5
6
7
8
9
153
370
371
407

Process finished with exit code 0
```

8.Store and display the days of a week as a **List, Tuple, Dictionary, Set.** Also demonstrate different ways to store values in each of them. Display its type also.

```
print("Name: Athul Ajay")
print("Reg No: SJC22MCA-2017")
print("Batch: 22-24")
print()
days_list = ["Monday", "Tuesday", "Wednesday", "Thursday", "Friday", "Saturday",
"Sunday"]
print("List:", days_list)
print("Type:", type(days_list))

days_tuple = ("Monday", "Tuesday", "Wednesday", "Thursday", "Friday", "Saturday",
"Sunday")
print("Tuple:", days_tuple)
print("Type:", type(days_tuple))

days_dict = {0: "Monday", 1: "Tuesday", 2: "Wednesday", 3: "Thursday", 4: "Friday", 5:
"Saturday", 6: "Sunday"}
print("Dictionary:", days_dict)
print("Type:", type(days_dict))

days_set = {"Monday", "Tuesday", "Wednesday", "Thursday", "Friday", "Saturday",
"Sunday"}
print("Set:", days_set)
print("Type:", type(days_set))
```

OUTPUT:

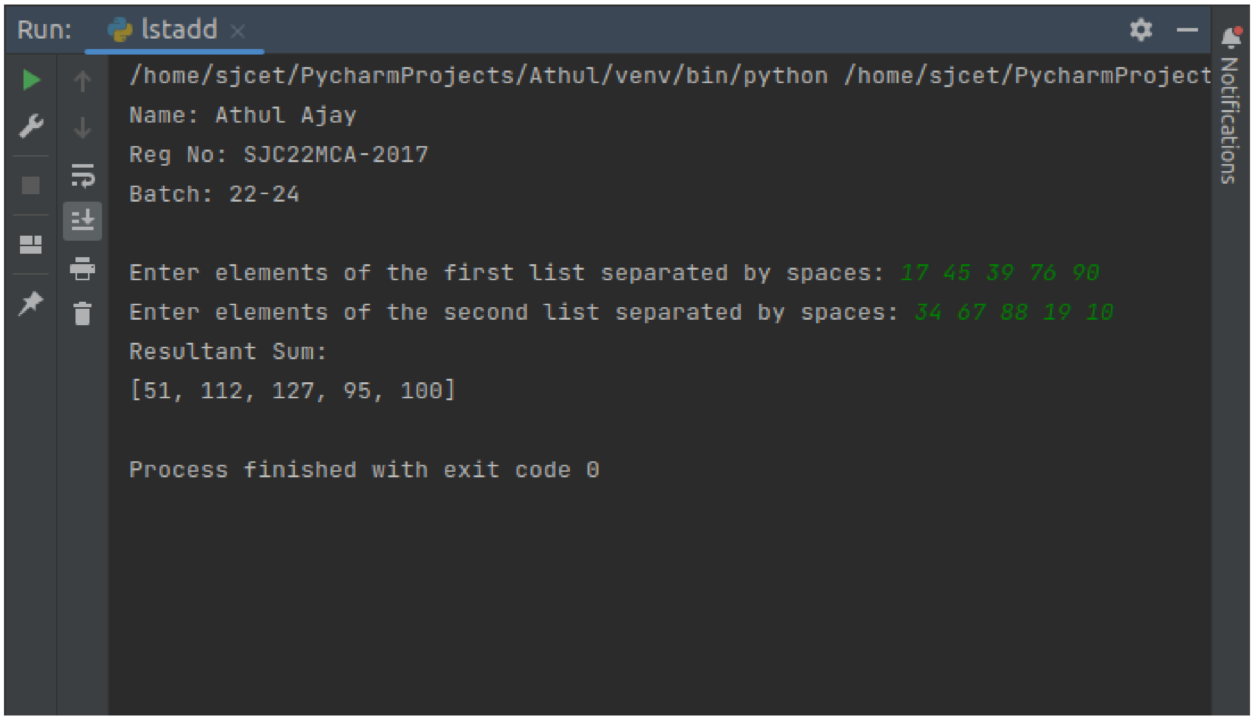


```
/home/sjcet/PycharmProjects/Athul/venv/bin/python /home/sjcet/PycharmProjects/Athul/S3/date.py
Name: Athul Ajay
Reg No: SJC22MCA-2017
Batch: 22-24

List: ['Monday', 'Tuesday', 'Wednesday', 'Thursday', 'Friday', 'Saturday', 'Sunday']
Type: <class 'list'>
Tuple: ('Monday', 'Tuesday', 'Wednesday', 'Thursday', 'Friday', 'Saturday', 'Sunday')
Type: <class 'tuple'>
Dictionary: {0: 'Monday', 1: 'Tuesday', 2: 'Wednesday', 3: 'Thursday', 4: 'Friday', 5: 'Saturday', 6: 'Sunday'}
Type: <class 'dict'>
Set: {'Saturday', 'Wednesday', 'Sunday', 'Thursday', 'Monday', 'Friday', 'Tuesday'}
Type: <class 'set'>

Process finished with exit code 0
```

9.Write a program to add elements of given 2 lists

```
print("Name: Athul Ajay")
print("Reg No: SJC22MCA-2017")
print("Batch: 22-24")
print()
def add_lists(list1, list2):

    if len(list1) != len(list2):
        return None

    result = []

    for i in range(len(list1)):
        result.append(list1[i] + list2[i])

    return result


list1_str = input("Enter elements of the first list separated by spaces: ")
list2_str = input("Enter elements of the second list separated by spaces: ")

list1 = [int(x) for x in list1_str.split()]
list2 = [int(x) for x in list2_str.split()]

if len(list1) != len(list2):
    print("Lists are of different lengths!!")
else:
    result_list = add_lists(list1, list2)
    if result_list is not None:
        print("Resultant Sum:")
        print(result_list)
```

OUTPUT:



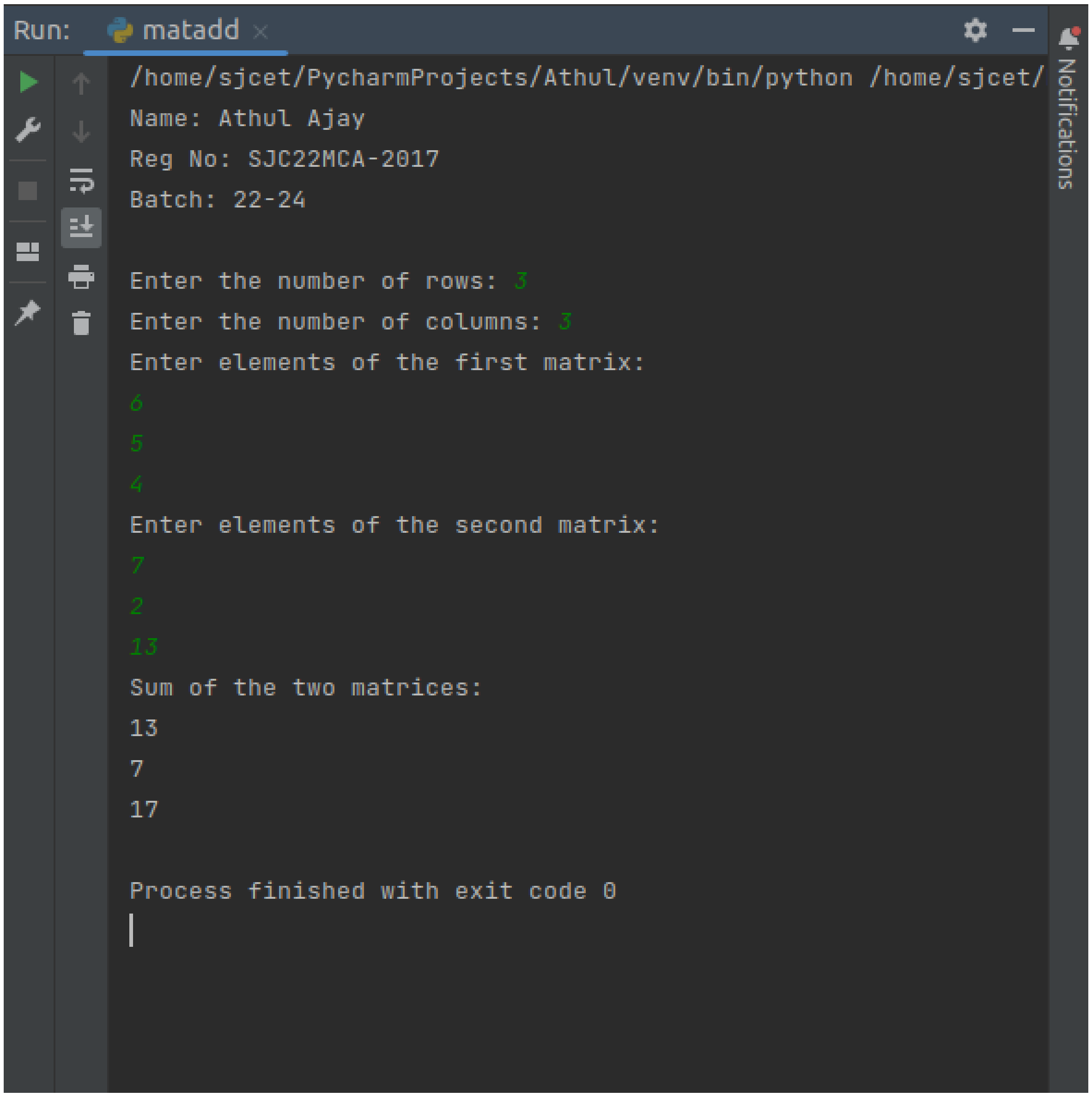
```
/home/sjcet/PycharmProjects/Athul/venv/bin/python /home/sjcet/PycharmProject
Name: Athul Ajay
Reg No: SJC22MCA-2017
Batch: 22-24

Enter elements of the first list separated by spaces: 17 45 39 76 90
Enter elements of the second list separated by spaces: 34 67 88 19 10
Resultant Sum:
[51, 112, 127, 95, 100]

Process finished with exit code 0
```

10. Write a program to find the sum of 2 matrices using nested List.

```
print("Name: Athul Ajay")
print("Reg No: SJC22MCA-2017")
print("Batch: 22-24")
print()

def add_matrices(mat1, mat2):
    rows = len(mat1)
    cols = len(mat1[0])


    result = [[0 for _ in range(cols)] for _ in range(rows)]



    for i in range(rows):
        for j in range(cols):
            result[i][j] = mat1[i][j] + mat2[i][j]

    return result



rows = int(input("Enter the number of rows: "))
cols = int(input("Enter the number of columns: "))

matrix1 = []
matrix2 = []
```

```
print("Enter elements of the first matrix:")
for i in range(rows):
    row = [int(x) for x in input().split()]
    matrix1.append(row)

print("Enter elements of the second matrix:")
for i in range(rows):
    row = [int(x) for x in input().split()]
    matrix2.append(row)

if len(matrix1) != len(matrix2) or len(matrix1[0]) != len(matrix2[0]):
    print("Matrices have different dimensions. Cannot perform addition.")
else:
    result_matrix = add_matrices(matrix1, matrix2)
    print("Sum of the two matrices:")
    for row in result_matrix:
        print(" ".join(map(str, row)))
```

OUTPUT:

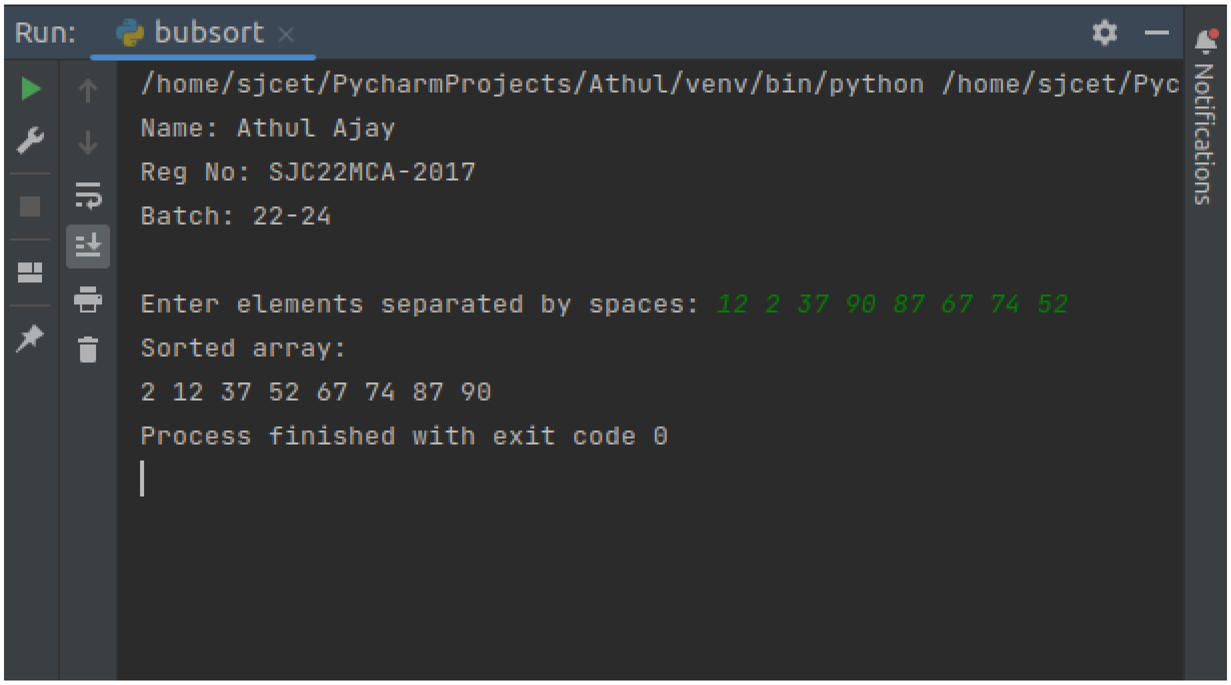


```
/home/sjcet/PycharmProjects/Athul/venv/bin/python /home/sjcet/
Name: Athul Ajay
Reg No: SJC22MCA-2017
Batch: 22-24

Enter the number of rows: 3
Enter the number of columns: 3
Enter elements of the first matrix:
6
5
4
Enter elements of the second matrix:
7
2
13
Sum of the two matrices:
13
7
17

Process finished with exit code 0
```

11. Write a program to perform bubble sort on a given set of elements.

```
print("Name: Athul Ajay")
print("Reg No: SJC22MCA-2017")
print("Batch: 22-24")
print()
def bubble_sort(arr):
    n = len(arr)

    for i in range(n):
        swapped = False

        for j in range(0, n - i - 1):
            if arr[j] > arr[j + 1]:
                arr[j], arr[j + 1] = arr[j + 1], arr[j]
                swapped = True

        if not swapped:
            break



str = input("Enter elements separated by spaces: ")
elements = [int(x) for x in str.split()]

bubble_sort(elements)

print("Sorted array:")
for element in elements:
    print(element, end=" ")
```

OUTPUT:

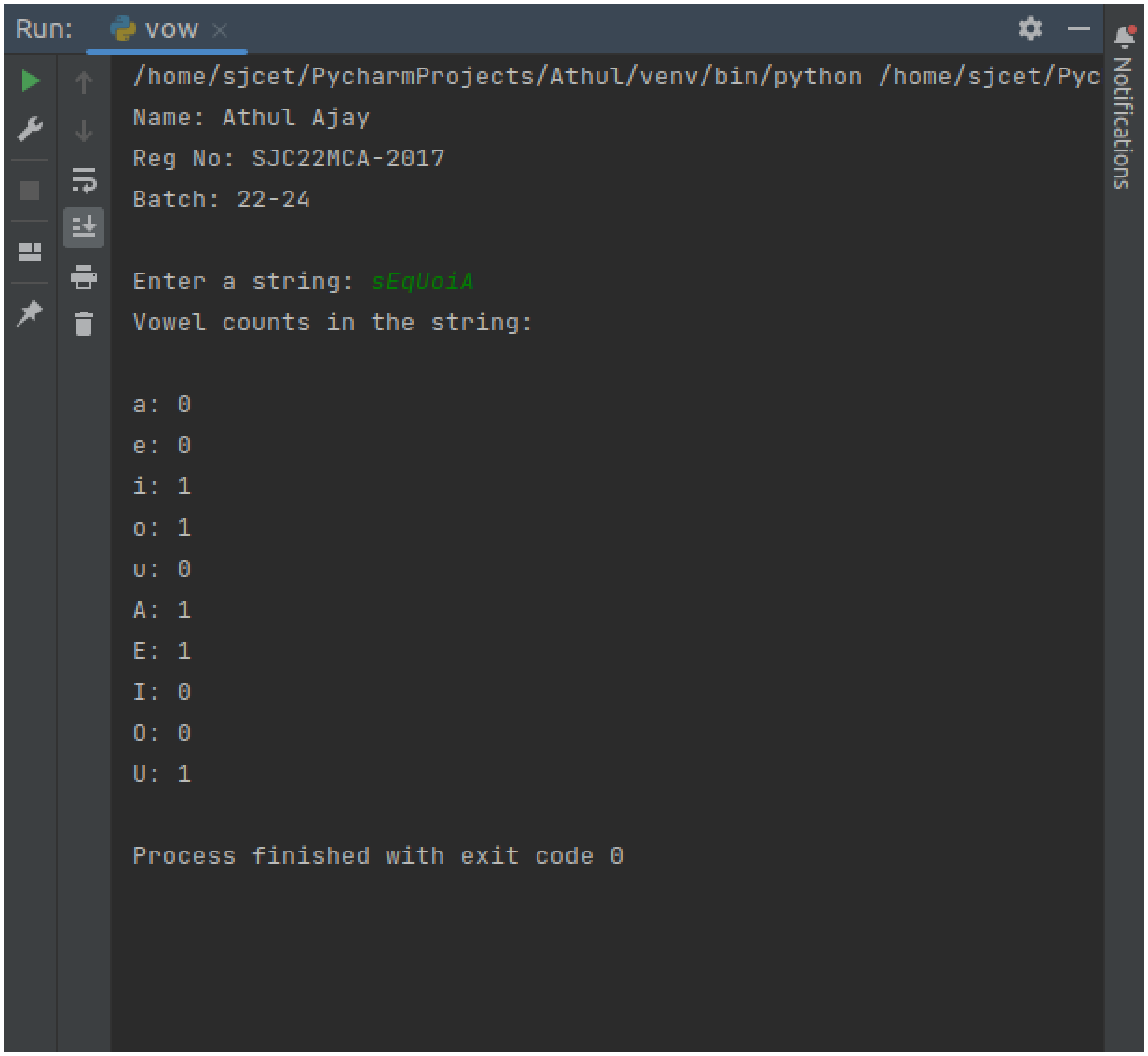


```
/home/sjcet/PycharmProjects/Athul/venv/bin/python /home/sjcet/Pyc
Name: Athul Ajay
Reg No: SJC22MCA-2017
Batch: 22-24

Enter elements separated by spaces: 12 2 37 90 87 67 74 52
Sorted array:
2 12 37 52 67 74 87 90
Process finished with exit code 0
```

12. Program to find the count of each vowel in a string (use dictionary)

```
print("Name: Athul Ajay")
print("Reg No: SJC22MCA-2017")
print("Batch: 22-24")
print()
def count_vowels(input_string):
    vowel_counts = {'a': 0, 'e': 0, 'i': 0, 'o': 0, 'u': 0,
                    'A': 0, 'E': 0, 'I': 0, 'O': 0, 'U': 0}

    for char in input_string:

        if char in vowel_counts:
            vowel_counts[char] += 1

    return vowel_counts


input_string = input("Enter a string: ")

vowel_counts = count_vowels(input_string)

print("Vowel counts in the string:")
print()
for vowel, count in vowel_counts.items():
    print(f"{vowel}: {count}")
```

OUTPUT:

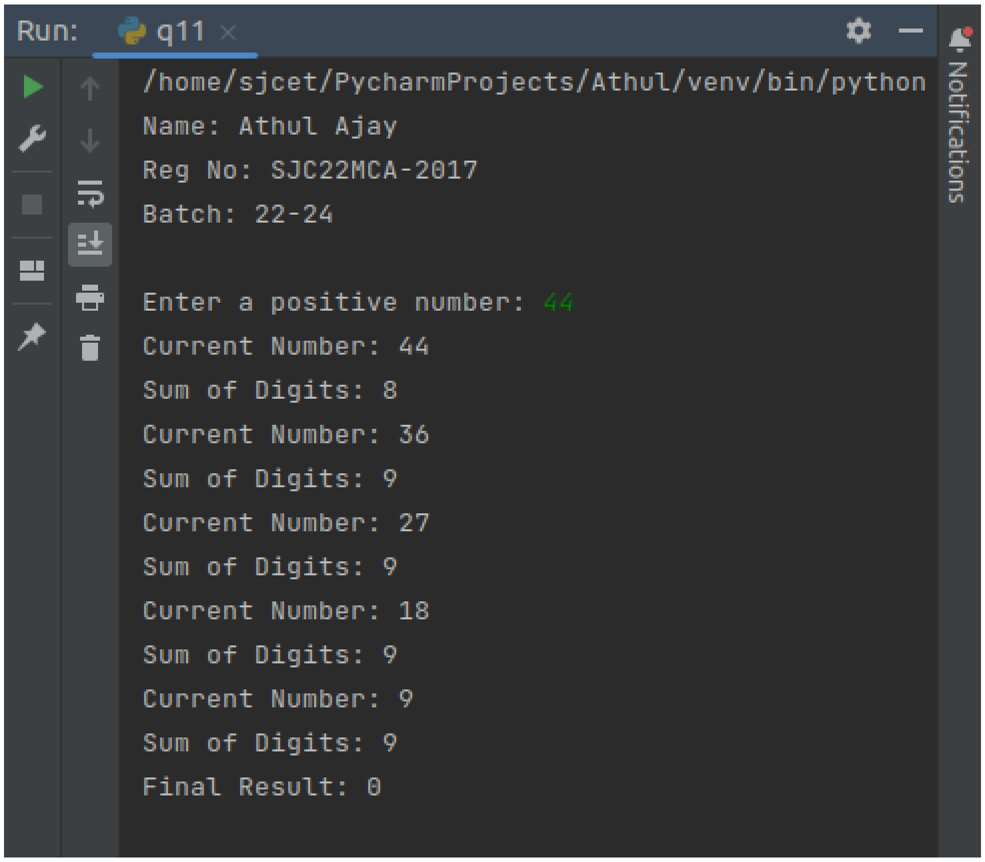


```
/home/sjcet/PycharmProjects/Athul/venv/bin/python /home/sjcet/Pyc
Name: Athul Ajay
Reg No: SJC22MCA-2017
Batch: 22-24

Enter a string: sEqUoiA
Vowel counts in the string:

a: 0
e: 0
i: 1
o: 1
u: 0
A: 1
E: 1
I: 0
O: 0
U: 1

Process finished with exit code 0
```

13. Write a Python program that accept a positive number and subtract from this number the sum of its digits and so on. Continues this operation until the number is positive (eg: 256->2+5+6=13, 256-13=243, 243-9=232

```
print("Name: Athul Ajay")
print("Reg No: SJC22MCA-2017")
print("Batch: 22-24")
print()
def sum_of_digits(number):

    digit_sum = 0
    while number > 0:
        digit_sum += number % 10
        number //= 10
    return digit_sum

def subtract_until_non_positive(number):
    while number > 0:
        print("Current Number:", number)
        digit_sum = sum_of_digits(number)
        print("Sum of Digits:", digit_sum)
        number -= digit_sum
    print("Final Result:", number)

num = int(input("Enter a positive number: "))

if num <= 0:
    print("Please enter a positive number.")
else:
    subtract_until_non_positive(num)
```

OUTPUT:

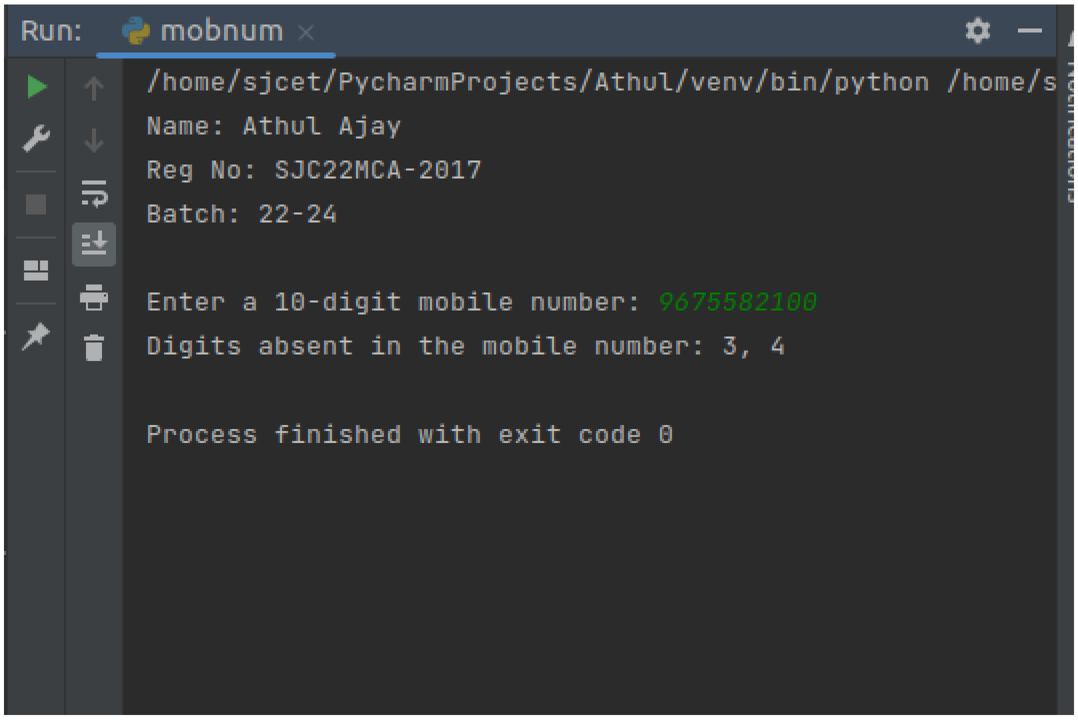


```
/home/sjcet/PycharmProjects/Athul/venv/bin/python
Name: Athul Ajay
Reg No: SJC22MCA-2017
Batch: 22-24

Enter a positive number: 44
Current Number: 44
Sum of Digits: 8
Current Number: 36
Sum of Digits: 9
Current Number: 27
Sum of Digits: 9
Current Number: 18
Sum of Digits: 9
Current Number: 9
Sum of Digits: 9
Final Result: 0
```

14. Write a Python program that accepts a 10-digit mobile number, and find the digits which are absent in a given mobile number

```
print("Name: Athul Ajay")
print("Reg No: SJC22MCA-2017")
print("Batch: 22-24")
print()
def find_absent_digits(mobile_number):
    all_digits = set("0123456789")

    mobile_digits = set(mobile_number)

    absent_digits = all_digits - mobile_digits

    return sorted(list(absent_digits))



mobile_number = input("Enter a 10-digit mobile number: ")

if len(mobile_number) == 10 and mobile_number.isdigit():
    absent_digits = find_absent_digits(mobile_number)
    if absent_digits:
        print("Digits absent in the mobile number:", ", ".join(absent_digits))
    else:
        print("All digits are present in the mobile number.")
else:
    print("Invalid input. Please enter a valid 10-digit mobile number.")
```

OUTPUT:



```
/home/sjcet/PycharmProjects/Athul/venv/bin/python /home/s
Name: Athul Ajay
Reg No: SJC22MCA-2017
Batch: 22-24

Enter a 10-digit mobile number: 9675582100
Digits absent in the mobile number: 3, 4

Process finished with exit code 0
```